Learning Theories Relevant to Math Teaching

Learning Theory	Summary	Relevant to Math Teaching
ARCS Model of Motivational Design (John Keller)	Theory promotes motivational Learning. It consists of four steps: 1. Attention - uses variety of strategies to gain student's attention and arouse their learning. 2. Relevance - motivates the students to learn and states important values to learn the materials. 3. Confidence – set goals and assessments so that the learners could succeed. 4. Satisfaction – provides feedback to learners so that they could assess their performance and have a sense of achievement.	Math concepts could be boring and challenging to understand. Some students are not interested in it and could easily fall behind. This could lead to serious problems because math is a cumulative discipline and if they did not learn the building blocks they cannot expand their math skills. Therefore, ARCS Model of Motivational Design theory is useful to entice the students to learn and promotes math interest. Math teachers could use hooks to gain students attention, interest and then link math concepts with their relevant life events. Teachers set objectives and provide regular feedbacks so that students could gain confidence and satisfaction when they meet these learning goals.
Multiple Intelligences Theory (Howard Gardner)	Theory emphasizes various ways to convey knowledge to learners. There are seven ways "people understand and perceive the world" and they are Linguistic, Logical-Mathematical, Visual-Spatial, Body-Kinesthetic, Musical-Rhythmic, Interpersonal and Intrapersonal.	It is important to have several methods to convey math knowledge. Students learn differently. Some students are able to grasp the math concepts by use of spoken or written words, (linguistic capability). While other students require to visualize the objects, (visual-spatial capability) by drawing diagram to solve a math problem. Different methods used to convey math knowledge will capture students' interest in learning math and could explain the math concepts more effectively. Examples include computer games involving math or watching math videos or simply working in groups to solve math questions.
Social Learning Theory (Albert Bandura)	Theory discusses how students could learn from peers by "observation, imitation and modeling." This theory connects the behaviorist and cognitive learning theories because it requires learners to observe peer's behavior, remember it and have motivation to imitate it.	Some students are motivated to learn math material from their peers. When they see their peer solve a math problem they are inspired to do it too. This is even truer for quiet and shy students who find teacher scary or intimidating or even difficult to understand. Some students are comfortable with their peers tutoring them. They could connect easier with them. They are not afraid to express themselves and be judged during the stage of exploring, learning and challenge among themselves. This theory will give students opportunity to explore the different venue of learning math. Hence, it is a good theory to incorporate into math teaching.
Discovery Learning (Jerome Bruner)	Theory believes students can learn best when they do the exploring and discovering. This can be accomplished by	This theory provides different way for students to learn math. This is effective for deriving math proofs or math laws. Students can derive laws by applying prior knowledge and reasoning to discover new math formulas. An example would be when students are

	students accessing their prior experience and knowledge and reasoning out the new concept.	required to use the (prior math skills) exponential laws and other math properties to derive the (new concepts) product, quotient and power logarithmic laws.
Maslow's Hierarchy of Needs (Abraham Maslow)	Theory expresses the basic human needs in a hierarchy pyramid known as the Maslow's Hierarchy of Needs. It consists of five levels: Self-actualization, Esteem, Belongingness, Safety and Physiological. The four lower levels, (Esteem, Belongingness, Safety and Physiological) must be met before the higher fifth level; (Self-actualization) can be achieved.	Math is a complex subject. Students need to be alert and stay focus on the math lesson. In order for students to concentrate on learning math, achieve math curriculum learning goals and feel satisfied, students need all their four lower levels of Maslow's Hierarchy of Needs to be met. This means math teachers should allow students to snack on food, go to the washroom, feel safe at school, have a sense of belonging and be respected among others in the classroom. Once the student has met all these needs, they could focus on learning math.

Learning Theories Diagram